

Green-Horse Habitat Restoration and Maintenance Project

Recreation, Visual Quality and Special Uses Report

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Introduction

This report analyzes the effects of the proposed Green-Horse Habitat Restoration and Maintenance Project (Green-Horse Project), along with the no action and one alternative, on recreation, visual quality, and recreation special uses (e.g., marinas, recreation residences, concession campgrounds, outfitter and guides) values within and adjacent to the project area. The findings of this report are presented in Chapter 3 of the Environmental Impact Statement (EIS).

Regulatory Framework

Policy, Laws, and Direction

The following current laws, policy, and direction apply to the recreation, scenic and special uses resources for the Green-Horse Habitat Restoration and Maintenance Project:

- Forest Service Manual 2300 (Recreation, Wilderness, and Related Resource Management)
- Forest Service Manual 2700 (Special Uses Management)
- Northwest Forest Plan Record of Decision (April 13, 1994)
- Clean Air Act of 1963 (Public Law 91-604 [42 U.S. C. 7401-7626])
- National Environmental Policy Act of 1969 (Public Law 94-52 [42 U.S. C. 4321-4347])
- Public Law 89-336 – Nov. 8, 1965 – An Act to establish the Whiskeytown-Shasta-Trinity National Recreation Area...
- Agriculture Handbook 462 – National Forest Landscape Management Volume 2 (1974)
- Agriculture Handbook 701 – Landscape Aesthetics – A Handbook for Scenery Management (1995)
- Shasta-Trinity National Forest Land and Resource Management Plan (forest plan) and Record of Decision (April 28, 1995)

Forest Service Manual (FSM) Direction

Forest Service Manual (FSM) 2380.12¹ directs that

- The rules at Title 36 of the Code of Federal Regulations, Part 292, National Recreation Areas (36 CFR part 292), include requirements for preservation, conservation, and protection of natural, scenic, and pastoral values, and other values contributing to public enjoyment of these areas.

FSM 2380.43² directs that

¹ USDA Forest Service 2003

² Ibid

- Ensure application of the principles of landscape aesthetics, scenery management, and environmental design in project-level planning.

FSM 2380.62³ directs that

- Agriculture Handbook (AH) 462 has been superseded by AH 701, “Landscape Aesthetics, A Handbook for Scenery Management.” Nevertheless, consult the superseded AH 462 for background information useful in understanding Forest land and resource management plans and other resource planning activities which utilized the Visual Management System in place prior to publication of AH 701.

FSM 2382.3⁴ directs the Forest Service to

- Update the scenery inventory using the Scenery Management System in Agriculture Handbook 701 (FSM 2380.61, para. 2). The recommended timeframe for updating the scenery inventory is prior to or at initiation of Forest land and resource management plan revisions.

FSM 4063.34⁵ directs the Forest Service to

- Use only tried and reliable vegetation management techniques in Research Natural Areas and then apply them only where the vegetative type would be lost or degraded without management. The criterion is that management practices must provide a closer approximation of the naturally occurring vegetation and the natural processes governing the vegetation than would be possible without management.

Forest Plan Direction

The following specific direction found in the Shasta-Trinity National Forest Land and Resource Management Plan (Forest Plan)⁶ applies to the Green-Horse Habitat Restoration and Maintenance Project.

Forest Goals

Recreation/Special Uses

- Manage the Shasta-Trinity National Forests land base and resources to provide a variety of high quality outdoor recreation experiences.⁷
- Increase emphasis on areas of national significance such as Mt. Shasta, the Whiskeytown-Shasta-Trinity National Recreation Area (NRA), and the Wild and Scenic Rivers System.⁸

Visual Quality

³ USDA Forest Service 2003

⁴ Ibid.

⁵ USDA Forest Service 2005

⁶ USDA Forest Service 1995a

⁷ Forest plan p. 4-5

⁸ Ibid.

- Maintain a diversity of scenic quality throughout the Forests, particularly along major travel corridors, in popular dispersed recreation areas, and in highly developed areas.⁹

Standards and Guidelines

Recreation/Special Uses

- Manage developed recreation sites according to the Recreation Opportunity Spectrum (ROS) classes.¹⁰
- Prepare objectives and prescriptions for managing vegetation in and around developed recreation sites.¹¹
- Management direction for the Whiskeytown-Shasta-Trinity NRA will be based on and responsive to the following (as written in Title 36, CFR, Section 251.41[a]).¹²
 - Provide public outdoor recreation opportunities;
 - Conserve scenic, scientific, historic, and other values that contribute to public enjoyment;
 - Manage, use, and dispose of renewable natural resources which will promote, but do not significantly impair, public recreation or conservation of scenic, scientific, historic, or other values contributing to public enjoyment.

Visual Quality

- Manage activities and projects to meet adopted Visual Quality Objectives (VQOs).¹³
- In the Interstate 5 travel corridor, the middle ground portions (areas between ¼ to ½ mile and 3 to 5 miles from the road viewer will be managed primarily to meet the adopted VQO of PR [Partial Retention].¹⁴

Management Prescription Direction

Management Prescriptions apply a management theme to specific types of land. Within the general framework of the Forest Standards and Guidelines, they identify specific activities that are to be emphasized or permitted on that land and their associated standards and guidelines. The project area includes management prescriptions II, III, VI, VII, VII, IX and X.

Management Prescription II – Limited Roaded Motorized Recreation

- Campsites and wildfire suppression camps should be primitive in nature. On-site restrictions and controls can be present, but subtle.¹⁵

⁹ Ibid.

¹⁰ Forest plan p. 4-23

¹¹ Forest plan p. 4-24

¹² Forest plan p. 4-24

¹³ The assignment and management of VQOs was guided by the 1974 Visual Management System Handbook (Agriculture Handbook 462). That handbook was superseded by the 1995 Landscape Aesthetics – a Handbook for Scenery Management (Agriculture Handbook 701), which on page 2-4 equates the VQO of Preservation to a Scenic Integrity Level of “Very High”.

¹⁴ Forest plan p. 4-28

¹⁵ Forest Plan p. 4-47

- Management activities will be compatible with Semi-Primitive Motorized ROS guidelines.¹⁶
- Design vegetative manipulation to meet recreation, wildlife, and forest health objectives within the context of an ecosystem management plan.¹⁷
- Adjacent management activities that are seen from within developed recreation sites will meet a VQO of retention in the foreground and partial retention in the middle ground. The area within the developed recreation site will meet a VQO of retention.¹⁸

Management Prescription III – Roaded Recreation

- Plan, design, and implement management activities that are compatible with Roaded Natural ROS guidelines.¹⁹
- Management activities that are seen from developed recreation sites will meet a VQO of retention in the foreground and partial retention in the middle ground.²⁰
- Manage to meet adopted VQOs of retention, partial retention, or modification as indicated on the adopted VQO map. Unseen areas within any mapped VQO may be managed for modification except in recreation river corridors.²¹

Management Prescription VI – Wildlife Habitat Management

- Management activities should be compatible with Roaded Natural ROS guidelines.²²
- Manage to meet adopted VQOs of retention, partial retention, or modification as indicated on the adopted VQO map.²³

Management Prescription VII – Late-Successional Reserve and Threatened, Endangered and Selected Sensitive Species

- Management activities should be compatible with Semi-Primitive Non-Motorized or Semi-Primitive Motorized ROS guidelines.²⁴

Management Prescription VIII – Commercial Wood Products Emphasis

- Recreation Opportunity Spectrum (ROS) experiences will be compatible with timber objectives. In most cases this will be the Roaded Natural Recreation ROS class.²⁵
- Manage to meet the adopted Visual Quality Objectives (VQOs) of partial retention, modification, and maximum modification as shown on the adopted VQO map.²⁶

Management Prescription IX – Riparian Management

¹⁶ Ibid.

¹⁷ Ibid.

¹⁸ Forest Plan p. 4-49

¹⁹ Forest planPlan p. 4-65

²⁰ Ibid.

²¹ Ibid.

²² Forest planPlan p. 4-66

²³ Ibid.

²⁴ Forest planPlan p. 4-44

²⁵ Forest Plan p. 4-67

²⁶ Ibid.

- Fish habitats will be maintained and enhanced along with those semi-primitive non-motorized recreation opportunities associated with riparian areas.²⁷

Management Prescription X – Special Area Management

- Management activities should be compatible with Semi-Primitive Non-Motorized ROS guidelines²⁸.

Management Area (MA) Direction

The Shasta-Trinity National Forest is divided into 22 Management Areas with separate, distinct management direction in response to localized issues and resource opportunities. The project area includes two Management Areas: MA8 National Recreation Area and MA12 Nosoni. Supplemental management direction applicable to the Green-Horse Habitat Restoration and Maintenance Project based on Management Area is as follows:

National Recreation Area

- Natural fuel manipulation for fire hazard reduction will be done to maximize protection of forest investments and interface areas.²⁹

Nosoni

- Reduce naturally occurring fuels to protect forest investments and interface areas from losses due to wildfire.³⁰
- Provide low development and dispersed recreation facilities and emphasize hunting, fishing, and hiking opportunities.³¹

Desired conditions of the STNF is embodied in the Forest Goals and Objectives, further clarified by the standards and guidelines, and finally described for each Management Area.³² The Forest Plan describes the following desired conditions related to recreation, visual quality, and recreation special uses for the two management areas:

National Recreation Area—The Shasta Unit of this MA is managed as a showcase recreation area. It provides high quality recreation opportunities at a variety of lake levels. Associated scenic, scientific, and historical values are conserved.³³ Management of renewable resources is compatible with public recreation or other values contributing to public enjoyment. Vegetation is managed to a level that results in healthy forest stands, maintenance of wildlife habitat, good scenic quality, public health and safety, and reduction of fire hazards. Management activities maintain the visual quality at a level which provides for a landscape in which human activities are subordinate to the natural landscape. Full service resorts are permitted and managed to meet current recreation demands will allowing for appropriate protection of other resource values.³⁴

Nosoni—There are opportunities for a wide variety of dispersed recreation activities. Many recreational programs and facilities are in support of hunting and fishing. The visual character of

²⁷ Forest Plan p. 4-59

²⁸ Forest planPlan p. 4-49

²⁹ Forest Plan p. 4-115

³⁰ Forest Plan p. 4-131

³¹ Ibid.

³² Forest Plan p. 4-6

³³ Forest Plan p. 4-111

³⁴ Forest Plan p. 4-112

this MA is affected by management practices on the National Forest but also by the presence of checkerboard pattern of private lands interspersed through the area. Generally those private lands are more intensely managed.³⁵ Stand densities appear more open with less ingrowth particularly in stands on sites where wild fire plays a key role in stand development. The actual target stand densities depend upon stand species, site quality, stand age, and stand objectives.³⁶

Watershed Analysis (WA) Recommendations

Recreation and visual quality conditions in the project area were addressed in the Pit Arm Shasta Lake³⁷, Squaw Creek³⁸, and McCloud Arm Watershed Analysis³⁹. Key findings and/or recommendations to which the proposed action responds include the following:

Pit Arm Shasta Lake Watershed Analysis

- Recreation activities and other human uses in the watershed pose risks to other resources and increase the risk of human-caused fire starts.⁴⁰
- As accumulating untreated fuels increase fire risk and fire behavior potential in the watershed, the risk of adverse effects to recreation resources (e.g., scenery and access) also increases.⁴¹
- Manage fire and fuels in the watershed to reduce the risk of lightning- and human-ignited fires becoming major stand-replacing wildfires.⁴²

McCloud Arm Watershed Analysis

- There is a need to reduce fuel loads in high use recreation areas where fire risk is high.⁴³
- Visual quality is threatened by the potential for catastrophic wildfire and high levels of mortality.⁴⁴

Squaw Creek Watershed Analysis

- Catastrophic wildfires could result in the damage or loss of multiple resources including mid and late seral vegetation/habitats, mid and late seral species, recreation values and aesthetics, and life and property.⁴⁵

National Recreation Area Management Guide Recommendations (Shasta Unit)⁴⁶

- The emphasis of ecosystem management activities will be to: meet recreation, visual and wildlife objectives while maintaining healthy and vigorous vegetative communities, and

³⁵ Forest Plan p. 4-129

³⁶ Forest Plan p. 4-130

³⁷ USDA Forest Service 2010

³⁸ USDA Forest Service 1998a

³⁹ USDA Forest Service 1998b

⁴⁰ USDA Forest Service 1998b, p. 118

⁴¹ Ibid.

⁴² Ibid.

⁴³ USDA Forest Service 1998b, p. 5-3

⁴⁴ USDA Forest Service 1998b, p. 5-2

⁴⁵ USDA Forest Service 1998a, p. 104

⁴⁶ USDA Forest Service 1996

- restore, maintain, or enhance biodiversity to the extent feasible within the goals and objectives of NRA management.
- Social and economic considerations will be integral to any analysis or decision made regarding ecosystem management within the NRA.
- Prescribed fire and other fuel treatments such as thinning, mechanical piling, and pruning will be used to maintain and enhance visual resources.
- Recreation sites will be inventoried and vegetative management plans will be developed to ensure healthy and safe vegetation complexes are maintained over time.

Recreation

Analysis Methodology

Recreational resources were inventoried through existing map data, existing user survey data, Geographic Information System (GIS) data, Internet resources, and personal communication with STNF personnel. The forest plan was reviewed with respect to Management Direction to determine recreation-specific guidance. Additionally, Shasta-Trinity National Forest Recreational Activity Participation Data from the National Visitor Use Monitoring Report, FY2008, was used to determine recreation trends in the Shasta-Trinity National Forest. In conducting the analysis of effects to the recreation resource it is assumed that visitor use would not vary significantly from historical trends and that these patterns would continue to vary to the same degree based on non-project related variables leaving the effects of the project as the reason for resulting change. Conditions are compared against the Recreation Opportunity Spectrum (ROS). Additional analysis and related discussion can be found in the special uses and visual quality sections of this report.

The cumulative effects analysis area for recreation is defined by the outer extent of the 6th field (HUC 6) watersheds that comprise the project area. This effects analysis area takes into consideration the potential effects from this project and their relationship to recreation – which is influenced by visual quality – within and adjacent to the project area (e.g., as seen from Shasta Lake).

The time frame for measuring effects of the alternatives is 20 years from the completion of implementation or, in the event that the No Action alternative is selected, 20 years from the date of decision. This is the amount of time that the proposed fuels treatments are deemed to be effective (see the project Fire and Fuels Report).

Issues and Issue Indicators

The effect of proposed treatments on recreational activities has been identified as an issue. The duration and intensity of these effects is likely to be the most viable means of determining the impacts to visitor use.

Issue: Effect of project activities on recreational attributes and opportunities.

Issue Indicators:

- Duration and extent of recreation site and project area closures
- Duration and intensity of noise disturbance

- Duration and intensity of smoke disturbance

Recreational Opportunity Spectrum (ROS)

The Recreation Opportunity Spectrum (ROS) is a continuum of recreation opportunity settings. A recreation opportunity setting is a combination of physical, biological, social, and managerial conditions that give value to a place. The ROS assumes that recreationists seek a range or spectrum of recreational opportunities from the highly constructed and interactive to the natural and solitude-oriented. The Shasta-Trinity National Forest uses five classes:

1. **Primitive (P):** Characterized by essentially unmodified natural environments with size and configuration assuring remoteness from the sights and sounds of human activity.
2. **Semi-Primitive Non-motorized (SPNM):** Characterized by predominantly natural or natural appearing landscapes and the absence of motorized vehicles. The size gives a strong feeling of remoteness. The presence of roads is tolerated, provided they are closed to public use, used infrequently for resource protection and management and road standards are visually appropriate.
3. **Semi-Primitive Motorized (SPM):** Characterized by predominantly natural or natural appearing landscapes and the presence of motorized vehicles. The size gives a strong feeling of remoteness.
4. **Roaded Natural (RN):** Characterized by predominantly natural-appearing settings with moderate sights and sounds of human activities and structures.
5. **Rural (R):** The sights and sounds of human activity are readily evident while the landscape is often dominated by human-caused geometric patterns.

Affected Environment

The Shasta Unit of the Whiskeytown-Shasta-Trinity NRA and the surrounding forest that encompasses the project area is one of the most frequented outdoor recreation sites in California.

According to the 2009 National Visitor Use Monitoring Report⁴⁷, the more popular (10% or greater participating) recreational activities in the STNF both in the NRA and outside the NRA include relaxing, viewing scenery and wildlife, fishing, hiking/walking, pleasure driving, picnicking and other non-motorized activities. Additionally, the more popular recreational activities in the NRA include motorized water activities, camping, off-highway vehicle (OHV) use, and motorized trail use.

During the summer high use period facilities are generally filled to capacity with an excess of 1 million person/visitor days per year recorded. Up to 80 percent of the visitor use occurs between the Memorial Day and Labor Day weekends. Lake level is a strong component of visitor use in the latter portions of the season but, during years with particularly low water yield, it can be a factor throughout the year – with some visitor facilities closing due to lack of lake access.

The Pit, Squaw Creek, and McCloud Arms of Shasta Lake are immediately adjacent to the project area and represent a significant portion of the lake. Heavy visitor use occurs on this portion of the lake, primarily in the lower stretches of these arms centered between Holiday Harbor Resort & Marina-Bridge Bay Resort-Jones Valley Resort. Recreational use of the lake becomes dramatically less in the upper reaches of these arms.⁴⁸

⁴⁷ USDA 2008

⁴⁸ USDA Forest Service 1996

The eastern half of Shasta Lake sees particularly heavy houseboat use, although smaller watercraft also use the lake and upstream tributaries. Lake use is a year-round occurrence with the vast majority of visitor days happening during the summer months. The quality of boater experience is considered high with satisfaction levels rated across varying boater uses and encounter types.⁴⁹

There are two developed recreation sites in the project area (Greens Creek Campground and Chirpchatter Campground). However, many others are in close proximity and are likely to be influenced by the project (see cumulative effects analysis). These locations include the following:

Hirz Mountain Lookout	Dekkas Rock Campground
Hirz Bay Boat Launching Facility	Holiday Harbor Resort and Marina
Hirz Bay Campground	Bailey Cove Boat Launching Facility
Bailey Cove Trail	Ski Island Campground
Bailey Cove Campground	Bridge Bay Resort
Mariners Point Campground	Jones Valley Resort
Silverthorn Resort and Marina	Lower Jones Valley Campground
Upper Jones Valley Campgrounds	Arbuckle Flat Campground
Jones Valley Boat Launching Facility	Clikapudi Trail
Madrone Campground	

Many other recreation sites on private property are also likely to be influenced due to their proximity to this project. Similarly, the project spans three of the four arms of Shasta Lake, so the project area is highly visible from many areas of the lake as well as from roadside vistas and vantage points found in the eastern portion of the NRA.

The project area encompasses the following ROS classes: Semi-Primitive Non-motorized, Semi-Primitive Motorized and Roded Natural.

Fire, forest closures, fire and fuels management activities can all have significant impacts on the recreational use of National Forest lands.⁵⁰ In spite of fire exclusion efforts, the project area and Shasta Lake in general has seen increases in accidental fires associated with recreational activities and in arson near human developments. Fire exclusion near these developments often causes increases in tree and shrub density.⁵¹ The Shasta Lake Ranger District experiences a large number of wildfire ignitions annually; of these approximately 81 percent are human-caused.⁵² The high level of visitor use – and the accompanying risk of human-caused ignitions, when combined with current fuel conditions, increases the risk of large, high-severity fires within the project area.

Desired Condition

Desired Future Condition for the two management areas in the project area is discussed above in the Regulatory Framework section along with the standards and guidelines for achieving these

⁴⁹ Graefe et al. 2005

⁵⁰ Starbuck et al. 2006

⁵¹ USDA Forest Service 2009

⁵² USDA Forest Service 2011

desired conditions. Specific to recreation, the desired condition provides high quality recreation opportunities as well as a wide variety of recreation activities. The desired landscape character related to recreation is a healthy forest ecosystem that helps to provide a desirable and varied experience to those who visit the area, that meets assigned Recreational Opportunity Spectrum (ROS) class attributes, and that preserves scenic quality from sensitive viewpoints.

Research has found that the vast majority of forest recreationalists, regardless of activity, prefer scenic settings.⁵³ Researchers stress the importance of visual variation as a landscape quality in recreation areas, and regard visual variation in recreation forests as crucial to the recreation experience.⁵⁴

Many landscape preference studies have shown striking uniformity in the type and composition of landscapes people find visually appealing and those they do not. There are four common aspects of visually preferred settings:

1. Large trees
2. Herbaceous, smooth groundcover
3. Open midstory canopy with high visual penetration
4. Vistas with distant views and high topographic relief⁵⁵

Research on visual preference of forest recreation vistas found that forest vistas containing streams and rivers have the highest scenic quality, followed by those with stationary water (ponds and lakes). Mountain views with four to five layers of ridges in the background were next in preference. Pastoral views of valleys with various types of development followed in scenic quality. Least preferred were vistas of only one mountain range, and vistas in which forest vegetation blocked a portion of the view.⁵⁶

In some instances, fuels management can improve recreation opportunities. For example, forest thinning and prescribed fire can increase wildlife habitat by creating forest openings and grass habitat for certain species that are hunted, such as deer, elk, and game birds. In the same way, the early successional landscapes created are important for wildlife viewing, one of the fastest growing recreational activities in forests.⁵⁷

Recreational acceptability of prescribe fire differs substantially by recreation activity, with camping and picnicking showing the greatest sensitivity. Although, campers disliked effects of light fires, even though scenic quality improved and more than 90 percent of the sample approved of prescribed burning. Severe fires should be expected to deteriorate both scenic quality and recreational acceptability (excepting nature study) significantly and for a long time. Camping and picnicking are essentially precluded for these areas.⁵⁸

Project Design Features

A complete description of project design features for all resources is in Chapter 2 of the EIS. Design features, unless stated otherwise, apply to all action alternatives for this project.

1. Trail system features (such as bridges, signs or benches) would be protected from potential impact from prescribed fire by removing combustible material from around the

⁵³ Ribe 1994

⁵⁴ Axelsson-Lindgren 1987

⁵⁵ Ryan 2005

⁵⁶ Hammitt 1994

⁵⁷ Gobster 2001

⁵⁸ Taylor 1984

- feature. Any significant impacts to maintained trails (such as tread or erosion features) within the project area would be repaired as soon as possible following treatment.
2. The treatment prescription within 150 feet of developed recreation sites would allow for specific understory trees and brush (i.e., vegetation less than 10 feet high) to remain where they provide important screening and privacy between camping and picnic sites (also applies to Visual Quality). Recreation staff would assist in identifying vegetation to be treated and would conduct inspection during project implementation.
 3. To minimize accidental tripping injuries, tree and brush stumps would be cut flush with the ground and covered with forest litter or dirt (after being treated with a borate compound) within and approximately 150 feet outside of designated boundaries of developed sites and in high traffic areas such as informal paths to Shasta Lake.
 4. A notification plan would be developed and included in the burn plan for implementation of prescribed fire in the project area. It would describe notification procedures between the Forest Service and its cooperators, permitted users and the public. This may include signing along Forest Service roads, public notices or media releases, and/or public information stations. Gobster⁵⁹ and Ryan⁶⁰ recommend such communication efforts.
 5. Treatments within 0.25 mile of recreation sites would be implemented during periods of low public use (i.e., before Memorial Day Weekend or after Labor Day Weekend). Use of mechanical equipment (such as pumps or chainsaws) would not commence before 7 a.m. to minimize effects to the public.
 6. Proposed firelines would be constructed in a manner that conceals their location (such as covering with logs, brush, rocks or forest litter) when not in use. To reduce the potential for unwanted OHV use, vegetation within 20 feet of road center along all roads proposed for treatment would be maintained with gaps of less than 4 feet where such conditions exist.

Monitoring

Information gathered before, during, and after accomplishing project activities is used to determine the how effectively we accomplished our project objectives and design features. It provides a feedback mechanism not only for this project but for similar future projects. Monitoring is completed at recurring intervals as a basis for implementing direction in the forest plan. Project effectiveness monitoring is completed by routine sampling of specific projects at specified time intervals.

Monitoring of impacts to the public would occur through feedback from the public and/or permit holders. Recreation specialists would participate in monitoring the effectiveness of treatments, particularly where they affect developed recreation sites and visitor use.

Environmental Consequences

Alternative 1 – No Action

Under this alternative none of the proposed actions would occur, current management and uses of the National Forest System lands in the project area would continue and no direct effects to recreation would result. This alternative represents the existing conditions of the project area and the progression of these conditions that would occur naturally over time if we do not implement

⁵⁹ Gobster 1994

⁶⁰ Ryan 2005

an action alternative. This alternative provides a baseline of conditions for us to compare with potential effects of the action alternatives.

Direct, Indirect and Cumulative Effects

Absent a major natural event that significantly alters the vegetation or geology; or a public health or safety risk that results in an unforeseen public use restriction; recreation attributes and opportunities within the Green-Horse project area are unlikely to change in ways meaningful to consider in this analysis if no action is taken. ROS levels would be maintained at current values with semi-primitive motorized, semi-primitive non-motorized and roaded natural appearances. The increased risk and the potential consequences of a wildfire (see the Fire and Fuels report in the project file) is the greatest potential impact of taking no action. Occurrence of a high-severity wildfire could adversely affect recreation attributes and opportunities, as well as user safety, in the project area. Recreation visitors are often one of the largest groups affected during, and after, wildfire events.⁶¹

Developed Recreation

Recreation Infrastructure: Recreation infrastructure including site identification signs, kiosks, restrooms, tables, and water sources would not be directly affected by the No Action Alternative. These improvements would be subject to normal wear and tear over time. Unexpected events such as wildfire, accidents and vandalism may cause damage or change these improvements.

The greatest threat to recreation infrastructure would be from wildfire. No treatments would be conducted to reduce the existing high risk of wildfire that exists within the area. Wildfire could damage or destroy recreation infrastructure including site identification signs, kiosks, restrooms, table, and water sources. Wildfire could significantly modify the vegetation and the scenery (see Visual Quality discussion below) adjacent to and within the viewshed of developed recreation sites.

Access: The No Action Alternative would have no direct effects on the public's access to recreation sites. Current management would continue, including hazard tree removal.

In the event of a wildfire in the area, access to recreation sites may be disrupted or eliminated during and after the fire to maintain public safety. Wildfire could also damage or destroy recreation sites which could have a longer-term effect on access, and, in some cases, developed recreations sites may not be rebuilt. The public may avoid areas not under a managed access restriction due to smoke and undesirable post-wildfire conditions.

Public Safety: No treatments would be conducted to reduce the existing high risk of wildfire that exists within the area (Fire and Fuels section). Safe ingress and egress along roads and trails would not be improved or created, creating increased public safety concern in the event of a wildfire. Other safety concerns potentially resulting from a wildfire include falling snags and other tree hazards, flooding, debris flows, plugged culverts and landslides⁶².

Recreation Use, Experience and Revenue: In the event of a wildfire, during and following the event, recreation use, experience and revenues could be affected due to restriction of access to maintain public safety, avoidance of the area due to smoke, and undesirable post-wildfire conditions. Special use permittees (see Recreation Special Uses discussion below) and outdoor recreation based businesses may lose revenue. The campground concessionaire would be affected

⁶¹ Chavez and Knap (2007)

⁶² Chavez and McCollum 2004

by damage or loss of any of the government owned facilities that they operate as well as loss of their equipment.

Work done by Starbuck and others⁶³ has shown a negative response by recreational users when asked to comment on forest visit experiences in areas that have had catastrophic fire. The same study concluded that catastrophic burns decrease trips taken and that areas that have previously suffered catastrophic burns also see a decrease in recreation visits.⁶⁴ The Jones and Bear fires that occurred adjacent to the project area have greatly reduced visitor use experiences in the Jones Valley area and have created several recreational related issues for land managers.⁶⁵

A study by Vaux, Gardner, and Mills⁶⁶ on the impact of fire on forest recreation suggests higher intensity fires had negative effects on recreation values but also caution that the impact of fire was not always negative among their respondents, and preferences of recreationists may change over time. A contingent valuation study⁶⁷ revealed that the presence of a burn only resulted in a loss of value for recreationists if the fire was a crown fire. The losses in recreation net value were larger for more severe fires because recreationalists showed a strong reluctance to recreate on high severity fire sites than on low severity sites. Another economic study⁶⁸ showed that visitors were willing to pay to avoid burned areas, and that the presence of a fire influenced campsite choice.

Roads and Trails

Recreation Infrastructure: Recreation infrastructure including trail tread, road surfacing, bridges, culverts, waterbars and other drainage features, signs, fences, and other improvements related to the road and trail system would not be directly affected by the No Action Alternative. These improvements would be subject to normal wear and tear over time. Unexpected events such as wildfire, accidents and vandalism may cause damage or change these improvements.

The greatest threat to road and trail infrastructure would be from wildfire. No treatments would be conducted to reduce the existing high risk of wildfire that exists with thin the area. Wildfire could damage or destroy road and trail infrastructure including trail tread, road surfacing, bridges, culverts, waterbars, signs, and fences.

Access: The No Action Alternative would have no direct effects on the public's access to roads and trails. Current management would continue, including hazard tree removal.

In the event of a wildfire in the area, access to roads and/or trails may be disrupted or eliminated during the fire and after the fire to maintain public safety. Wildfire could also damage or destroy roads and/or trails which could have a longer-term effect on access. Roads and/or trails may need to be reconstructed or rerouted with improved drainage to prevent resource damage. Effects may include disruption of services (e.g. outfitter and guide operations and ability to maintain roads). The public may avoid areas not under a managed access restriction due to smoke and undesirable post-wildfire conditions.

Public Safety: The general effects to public safety as described for developed recreation sites would be similar for roads and trails.

⁶³ Starbuck et al. 2006

⁶⁴ Ibid.

⁶⁵ Grigsby 2010 personal communication

⁶⁶ Vaux et al. 1984

⁶⁷ Flowers et al. 1985

⁶⁸ Boxall et al. 1996

Recreation Use, Experience and Revenues: In the event of a wildfire, during and following the event, recreation use, experience and revenues could be affected due to restriction of access to maintain public safety, avoidance of the area due to smoke, and undesirable post-wildfire conditions. Wildfire could significantly modify the vegetation and the scenery (see Visual Quality discussion below) adjacent to and within the viewshed of roads and trails.

Analyses of burned area emergency reports revealed numerous direct impacts to hiking trails and campgrounds from fires (from fire damage), and many potential impacts to roads and hiking trails (tend to be linked to flooding after the fire event). Most impacts represented a loss of recreational opportunities.⁶⁹

Hesseln⁷⁰ found that both hikers and mountain bikers decreased their visitation following wildfire. In another study, Hesseln⁷¹ also found that size and extent of burns affect visitation where increases in the amount of area burned and amount of burn that could be seen from trails are associated with greater declines in recreation demand for hiking and biking.

Dispersed Recreation

Dispersed recreation includes recreation activities that take place outside of sites or areas that are developed or managed to concentrate recreation use. Overnight boating is one of the most popular recreational activities on the Shasta Unit of the NRA, with abundant moorage opportunities along the shoreline of Shasta Lake. Forest roads are also important for providing access to dispersed recreation sites and trails, fishing, hunting and other activities like wildlife viewing, driving for pleasure, gathering firewood, and off-highway vehicle (OHV) use.

Recreation Infrastructure: Infrastructure is not developed for dispersed recreation except to maintain public safety or protect resources and generally includes signs and gates. These features would not be directly affected by the No Action Alternative. These improvements would be subject to normal wear and tear over time. Unexpected events such as wildfire, accidents and vandalism may cause damage or change these improvements.

The greatest threat to recreation infrastructure would be from wildfire. No treatments would be conducted to reduce the existing high risk of wildfire that exists with thin the area. Wildfire could damage or destroy recreation infrastructure including signs and gates.

Access: The No Action Alternative would have no direct effects on the public's access to dispersed recreation opportunities.

In the event of a wildfire in the area, access to dispersed recreation may be disrupted or eliminated during the fire and after the fire to maintain public safety. Wildfire could also damage or destroy roads and/or trails which could have a longer-term effect on access. The public may avoid areas not under a managed access restriction due to smoke and undesirable post-wildfire conditions.

Public Safety: The general direct and indirect effects to public safety as described for developed recreation sites would be similar for dispersed recreation.

Recreation Use, Experience and Revenue: In the event of a wildfire, during and following the event, recreation use (including popular activities shoreline boat camping, off-highway vehicle (OHV) use) and experience could be affected due to restriction of access to maintain public safety, avoidance of the area due to smoke, and undesirable post-wildfire conditions (see Figure

⁶⁹ Chavez and McCollum 2004

⁷⁰ Hesseln et al. 2003

⁷¹ Hesseln et al. 2004a

1 below). Special use permittees (see Recreation Special Uses discussion below) and outdoor recreation based businesses may lose revenue. Wildfire could significantly modify the vegetation and the scenery (see Visual Quality discussion below) adjacent to and within the viewshed of developed recreation sites. Significant modification of the vegetation could increase the potential for trespass by OHV riders.



Figure 2. Debris in Shasta Lake from the August 2012 Bagley Fire—Damages following wildfire can significantly impact water quality and recreational opportunities for months or years after the burn.

Recreation Opportunity Spectrum

In the aftermath of a large high-severity fire the project area would likely not meet current Forest Plan ROS class requirements – and may not for many decades post-fire:

- due to the unnatural scenic character of a fire outside the historic range of variability, and
- the extent that recreation facilities (e.g. trails and campgrounds) and other related resources (e.g. roads, trailheads, etc.) are adversely impacted.

Alternative 2 – Proposed Action

This alternative proposes 41,836 acres of fuels treatments that would be accomplished over 7 to 10 years using an adaptive management strategy. The overall goal is to create a landscape that would be more resilient to fire, healthy and able to provide for quality recreational opportunities.

Direct and Indirect Effects

Public access to developed recreation sites, roads, trails, and dispersed recreation opportunities within the Green-Horse Project would be temporarily and intermittently prohibited during project implementation, resulting in short-term user displacement and dissatisfaction. Scheduling of prescribed fire treatments may overlap with peak hunting season (late September to early November). All sections of the project area would not be closed at the same time; however, the proposed action would be implemented in stages over the course of the project's duration. No

currently open or available facilities are proposed for closing, nor are other changes to site status as a result of this alternative, so overall opportunity is unaffected.

Application of the recreation project design features described above would minimize damage to developed recreation sites and trails, as well as reduce the potential for unwanted motorized access.

Smoke from prescribed fire operations is likely to be the largest impact to recreation activities. Air quality restrictions and the application of smoke management principles (as outlined in the Fire/Fuels/Air Quality/Vegetation Specialist Report) would reduce these effects. Periods of visible smoke would likely be of short duration but could have moderate effects to visitor use in and surrounding the eastern portion of Shasta Lake.

In some instances, fuels management can improve recreation opportunities. For example, forest thinning and prescribed fire can increase wildlife habitat by creating forest openings and grass habitat for certain species that are hunted, such as deer, elk, and game birds.⁷² Removal of overly dense small and intermediate trees would open up views to create a more open park-like setting and improve opportunities for wildlife observation, one of the fastest growing recreational activities in forests. In addition, implementing fuel reduction through prescribed fire would maintain or encourage ecological characteristics – such as large trees, open forest structure and reduced understory vegetation and downed material – over much of the project area. These characteristics have been shown to be favored by forest recreationists.⁷³

However, research also has shown that depending upon severity, prescribed fire can have negative impacts on recreation, especially on camping and picnicking, being the most sensitive recreation activities. This is especially true immediately after the fire, before the understory has regrown.⁷⁴

Reducing the possibility of wildfire would have a major, long-term beneficial effect on recreation attractions, attributes and experience. This would increase the protection for recreation infrastructure from direct combustion; trails and recreational roads from the increased chance of flooding, washouts and landslides following a major fire; and Shasta Lake from increased debris and sedimentation resulting from a major fire.

Evidence of human activity related to treatments, such as stumps, piling and dozer lines, would detract from the natural-appearing environment and would be somewhat inconsistent with Semi-Primitive Non-motorized, Semi-Primitive Motorized and Roaded Natural ROS classes in the short-term until these features were removed, rehabilitated, or naturally regenerated. However, effects associated with ROS pertain to how recreation settings will be affected once project implantation is completed, not during the process. Since the results of the completed project will reflect a forest that better meets its natural historic condition and provide for better protections against severe wildfires, no changes to existing ROS classifications are anticipated.

Cumulative Effects

As discussed in the project Fire/Fuels, Air Quality and Vegetation Report, this alternative would significantly decrease the risk of future large, severe wildfires. This in turn would support and encourage continued recreational use of the project area and reduce the threat from human-caused ignitions. The recreational experience would be maintained or enhanced under this alternative with improved environmental conditions favored by forest visitors.

⁷² Gobster 2001

⁷³ Gobster 1994

⁷⁴ Taylor and Daniel 1984

The Bureau of Reclamation (BOR) proposal to raise Shasta Dam and enlarge Shasta Lake reservoir is a foreseeable action. However, Alternative 2 would not add to any future displacement of recreation in the project area from the BOR project. Any adverse effects of the Green-Horse Project on recreation in the project area would be temporary and would likely have dissipated by the time the BOR project is implemented.

Possible future growth of the communities in northern California is likely to put increased demands on the project area for recreation opportunities. Higher visitor levels would increase the potential for accidental wildfires. With implementation of this alternative, the potential that a human-caused ignition would develop into a widespread, high-severity fire would be reduced. This would result in long-term major beneficial effects on both the recreation setting and experience. Safety issues related to a high-severity fire would also be reduced or minimized. Smoke impacts during future wildfires would be reduced (see the project Air Quality report in the project file), as would the risks to forest visitors. Reducing periods of poor visibility and poor air quality during wildfire events would reduce the impacts to visitor use during these periods.

Summary of Effects

The treatment activity under the proposed action may delay or restrict use of certain facilities or to places, and sights and sounds of management activity may be apparent, but these are temporary short in duration. ROS classifications will remain unchanged. All recreation related standards and guidelines will be met.

Alternative 3 – No Forest Plan Amendment

This alternative proposes 13,275 acres of fuels treatments, including 13,247 acres of prescribed fire that would be accomplished over 7 to 10 years using an adaptive management strategy. The overall goal is to create a landscape that would be more resilient to fire, healthy and able to provide for quality recreational opportunities.

Most high visitor use areas in the project area would be eliminated from treatment under this alternative. Many of the developed recreation sites proposed for treatment under Alternative 2 are also outside of the proposed treatment areas under this alternative. The only developed recreation sites within or near treatment areas under this alternative include Arbuckle Flat Campground, Chirpchatter Campground, Madrone Campground and the upper reaches of the Pit Arm of Shasta Lake.

Aspects of the discussion that apply to Alternative 2 apply to this alternative but are reduced in scale due to a significant decrease in the acreage of proposed treatments in proximity to recreation sites and areas of high visitor use. The effects are similar to Alternative 2; however, only a handful of developed sites would likely be affected (Chirpchatter Campground, Madrone Campground and Arbuckle Campground). While the effects in the treated areas are the same as disclosed for Alternative 2, in areas that remain untreated the effects would resemble those disclosed under the No Action Alternative.

Recreation Special Uses

The Shasta Unit of the Whiskeytown-Shasta-Trinity NRA has authorized a wide range of special use activities and facilities in support of public recreation, including socio-economic interests. Particular to this project are five marina/resorts (Bridge Bay, Holiday Harbor, Lakeview [closed], Silverthorn and Jones Valley), three recreation residence tracts, Shasta Caverns, and other

recreation-related enterprises. Few areas in the National Forest System have such a high concentration of special use authorizations.

For the purposes of this analysis, the discussion will focus on the potential economic impacts to these permittees as well as to the private sector in general. In 1993, it was estimated that as much as \$18.5 million in revenues related to the NRA were generated.⁷⁵ An evaluation was made to determine the effects of the alternatives on the special use program and related economic factors.

Issues and Issue Indicators

The effect of proposed treatments on special use permittees and related socio-economic values has been identified as an issue. These effects are best measured by their duration, intensity and potential limits to access related to these effects.

Issue: Effect of project activities on permittees.

Issue Indicators:

- Duration and intensity of effects of the proposed action
- Effects of the proposed action on access to special use permit areas

Analysis Methodology

Various sources (e.g., Forest Service personnel, special use permittees and third party capacity studies) provided information on agency-related and private sector economic data for this analysis. These data were used in a qualitative discussion of the alternatives.

The cumulative effects analysis area for special uses is defined by the special use permit boundaries that occur within the 6th field (HUC 6) watersheds that encompass the project area. The potential effects on operations within the permit sites during and after project implementation – and the related effects to the public's desire to use the services provided by permittees – were considered.

The time frame for measuring effects of the alternatives is 20 years from the completion of implementation or, in the event that the No Action alternative is selected, 20 years from the date of decision. This is the amount of time that the proposed fuels treatments are deemed to be effective (see the project Fire and Fuels Report).

Affected Environment

Special use permittees operating within and adjacent to the project area vary greatly but can be divided into two main groups: businesses and personal use. Special use permits allow the agency to manage use in a manner that respects natural resources and is fair and equitable. Permit holders are responsible for maintaining buildings and other infrastructure on public lands; these values are to be protected from threats such as wildfire.

Businesses such as marina/resort companies, outfitter/guides and tour operators are authorized to use public lands through special use permits obtained through the Forest Service.⁷⁶ These

⁷⁵ Ryan 2005

⁷⁶ Ibid.

businesses range in size from small, family-run organizations to large corporations with sizable operations.

Permits authorizing personal use of public lands cannot be utilized for commercial purposes and are limited to recreation residences, private boat moorages and registrations for privately-owned houseboats. The recreation residence program was initiated in the 1920s to encourage recreational use of public lands.⁷⁷ The residences are owned by private individuals, and a long-term permit is issued for the sites they occupy. Three recreational residence tracts are located within the project area – the Campbell Creek Tract on the McCloud Arm, the Didallas Tract on the Squaw Creek Arm and the Silverthorn Tract on the Pit Arm of Shasta Lake. Together, there are 109 private residences. As many as 2,800 moorage slips are authorized by the Forest Service, and about 650 privately owned houseboats are registered on Shasta Lake.

Desired Condition

Desired Future Condition for the two management areas in the project area is discussed above in the Regulatory Framework section along with the standards and guidelines for achieving these desired conditions. Specific

Full service resorts are permitted and managed to meet current recreation demands while allowing for appropriate protection of other resource values

Specific to special uses and related socio-economic concerns, the desired landscape character is a healthy forest ecosystem that helps to provide a desirable experience to those who visit the area or hold special use permits, which in turn will generate revenue for local businesses.

Project Design Features

A complete description of project design features for all resources is in Chapter 2 of the EIS. Design features, unless stated otherwise, apply to all action alternatives for this project.

1. A notification plan (i.e., within the prescribed fire burn plan) would be developed for implementation of prescribed fire in the project area detailing notification procedures between the Forest Service and its cooperators, permitted users and the public. This may include signing along Forest Service roads, public notices or media releases, and/or public information stations.
2. Treatments within 0.25 mile of recreation sites would be implemented during periods of low public use (i.e., before Memorial Day Weekend or after Labor Day Weekend). Use of mechanical equipment (such as pumps or chainsaws) would not commence before 7 a.m. to minimize noise effects to the public.

Monitoring

Information gathered before, during, and after accomplishing project activities is used to determine the how effectively projects are accomplished through project objectives and design features. It provides a feedback mechanism not only for this project but for similar future projects. Monitoring is completed at recurring intervals as a basis for implementing direction in the forest plan. Project effectiveness monitoring is completed by routine sampling of specific projects at specified time intervals.

⁷⁷ Ryan 2005

Monitoring of impacts to permittees would occur through feedback from the public and/or permit holders. Special uses permit managers would assist with monitoring feedback and analyzing content.

Environmental Consequences

Alternative 1 – No Action

Under this alternative none of the proposed actions would occur. Current management of the project area would continue. No change to the operations of those holding special use permits would result.

Direct, Indirect and Cumulative Effects

Implementation of no action would have no direct effects on special use permit holders. The socio-economic relationship between the project area, the eastern portion of Shasta Lake and visitor use that results in revenue would likely follow recent trends.

However, fuels in the project area would continue to accumulate and understory growth would proliferate, which would increase the risk that future wildfires would be widespread and severe (see the project Fire and Fuels Report). Such a fire could have negative effects on permit holders and the recreation industry associated with the project area and Shasta Lake in general. A high-severity fire could imperil buildings and other infrastructure associated with special uses in the project area. It would lead to area closures, poor air quality conditions and detrimental effects to natural resources. This would reduce the desirability of recreating in the area and lead to lost revenue for special use permittees and loss of interest in using personal permitted recreation opportunities (e.g., privately-owned houseboats and recreation residences).

A major wildfire would have both short- and long-term effects. The effects of smoke and the risks posed by wildfires would be generally short-lived and confined to the season in which they occur. Adverse effects to natural resources, however, could be evident for many decades – depending on site-specific conditions and on post-fire rehabilitation efforts. Additionally, area closures to protect forest visitors or to prevent further resource damage could extend for many years. These consequences would adversely impact potential business and recreational enjoyment of project area permittees. The Jones Valley area along the south shore of the Pit Arm of Shasta Lake experienced such adverse impacts following two significant wildfires.

Catastrophic forest fires in the recent past have increased the public's awareness of wildland fire and the detrimental effects caused by these events.⁷⁸ Other fuels reduction projects around Shasta Lake (Bear Hazardous Fuels Reduction Project, Northwoods Hazardous Fuels Project, Lakehead Community Fuels Reduction Project and others) have been successful in reducing the effects of high-severity wildfire,⁷⁹ however, conditions that are not spatially limited (e.g., smoke) may still affect recreation use and permits.

Alternative 2 – Proposed Action (Revised)

This alternative includes 41,836 acres of fuels treatments that would be accomplished over 7 to 10 years using an adaptive management strategy. The overall goal is to create a landscape that

⁷⁸ Ryan 2005

⁷⁹ Boyer 2011 personal communication

would be more resilient to fire, healthy and able to provide for quality recreational opportunities yielding sustained or increased revenue and outdoor recreational enjoyment.

Direct and Indirect Effects

The proposed treatments under Alternative 2 would reduce the potential for high-severity fire across the project area. This would enhance the long-term enjoyment of the recreating public and encourage continued use of the area. It would also enhance business for commercial permit holders and provide safe, high quality use for personal permittees.

During periods when prescribed fire is being applied, temporary, short-duration effects could be negative in areas near or where implementation occurs. Such effects would likely last a few hours to a few days and would occur outside of peak visitor use periods. The intensity of effects would likely be minimal to moderate and would be managed through design features and related guidance. Area closures for public safety may be needed during and immediately following implementation; closures would be limited to the areas treated and would be of short duration.

Smoke from prescribed fire operations would likely be the greatest impact to activities associated with special uses. Air quality restrictions and the application of smoke management principles (as described in the project Air Quality Report) would reduce these effects. Effects are likely to be of short duration but could have moderate effects to visitor use in the eastern portion of Shasta Lake, resulting in minor impacts to special use permits outside of peak season.

The proposed thinning activities, when conducted outside of peak season, could cause localized disturbance to permittees and their customers. These disturbances would be of short duration with only minor impacts. Project design features, which include coordination with special use managers and permittees and public notification, would reduce the adverse effects.

During implementation of this alternative, additional revenue would be produced through supplies and services provided by commercial permit holders. Boat rentals, fuel, moorage and other supplies and services could be obtained from existing special use permittees. Additional revenue would be generated in the local economy through the implementation of prescribed fire and thinning activities such as equipment rental, fuel, lodging and food and other general supplies and services commonly procured during prescribed fire operations.

Cumulative Effects

As discussed in the project Fire and Fuels Report, this alternative would significantly decrease the risk of future large, severe wildfires. Use of the project area associated with special use permits and related revenue earnings would likely be maintained or enhanced under this alternative.

The reduced risk of high-severity fire would likely sustain visitor use and corresponding revenues at or above current levels. As discussed in the effects analysis for recreational use (above), the proposed treatments would promote a landscape favored by forest visitors and would, therefore, encourage return visits.

The Bureau of Reclamation (BOR) proposal to raise Shasta Dam and enlarge Shasta Lake reservoir is a foreseeable action. However, Alternative 2 would not add to any future displacement of special uses in the project area from the BOR project. Any adverse effects of the Green-Horse Project on special uses in the project area would be temporary and would likely have dissipated by the time the BOR project is implemented.

Alternative 3 – No Forest Plan Amendment

Alternative 3 proposes 13,275 acres of fuels treatments that would be accomplished over 7 to 10 years using an adaptive management strategy. The overall goal is to create a landscape that would be more resilient to fire, healthy and able to provide for quality experiences in the project area and the eastern portion of Shasta Lake leading to an increase in revenue from current levels.

Most of the high visitor use areas would be eliminated from treatment under this alternative. Many of the commercial special use sites that are potentially affected also fall outside of treatment areas under this alternative. Customers of these permit holders do not frequent the areas that would be treated as often as other locations within the project area. The recreation residence tracts would not be treated under this alternative; while they would experience no direct impacts, they would not reap the benefits of fuels reduction described under Alternative 2. In addition, few privately-owned houseboats frequent areas that would be affected by this alternative.

While many of the effects of Alternative 2 also apply to Alternative 3, they are reduced in scale due to a significant decrease in treatment acres and the distance of the treatments from the recreation residences and other areas of high visitor use. The direct, indirect and cumulative effects to special uses are similar to those of Alternative 2 in the areas treated; however, few commercial permit holders and their customers would be affected, and any effects would be virtually unmeasurable. In the untreated areas, the direct, indirect and cumulative effects would be similar to the effects of Alternative 1 (no action).

Visual Quality

According to Agriculture Handbook 701,⁸⁰ research has shown that high-quality scenery – especially that related to natural-appearing forests – enhances people's lives and benefits society. Research findings support the logic that scenic quality and naturalness of the landscape directly enhance human well-being, both physically and psychologically, and contribute to other important human benefits.⁸¹ Specifically, these benefits include people's improved physiological well-being as an important by-product of viewing interesting and pleasant natural appearing landscapes with high scenic diversity.⁸²

The Shasta Unit of the Whiskeytown-Shasta-Trinity National Recreation Area (NRA) is characterized as a showcase recreation area.⁸³ It provides high quality recreation opportunities and associated scenic values that are to be conserved. Management activities are to maintain the visual quality at a level which provides for a landscape in which human activities are subordinate to the natural landscape.

Issues and Issue Indicators

The effect of proposed treatments on visual quality has been identified as an issue. These effects are measured by their duration and intensity.

Issue: Effects of the proposed action on visual quality and scenic values.

⁸⁰ USDA Forest Service 1995b

⁸¹ Ibid.

⁸² Ibid.

⁸³ Forest plan 4-111

Issue Indicator: Achievement of assigned VQOs and Scenic Integrity Levels.

Analysis Methodology

Visual quality analysis was conducted using the methods found in *Agriculture Handbook 462 – National Forest Landscape Management Volume 2*⁸⁴ and incorporating the concepts of scenic attractiveness and scenic integrity in the more recent *Agriculture Handbook 701 – Landscape Aesthetics: a Handbook of Scenery Management*.⁸⁵

The cumulative effects analysis area for visual quality is defined by the outer extent of the 6th field (HUC 6) watersheds that comprise the project area. This effects analysis area takes into consideration the potential effects from this project and their relationship to visual quality within and adjacent to the project area (e.g., as seen from Shasta Lake).

The time frame for measuring effects of the alternatives is 20 years from the completion of implementation or, in the event that the No Action alternative is selected, 20 years from the date of decision. This is the amount of time that the proposed fuels treatments are deemed to be effective (see the project Fire and Fuels Report).

Visual Management System (VMS)

The Shasta-Trinity forest plan utilizes the Visual Management System (VMS) to reduce visual quality impacts caused by management activities. VMS utilizes the distance of the project from the viewer, duration of the view, variety class and the sensitivity level of the viewpoint to assess visual impacts.

During the Forest Planning effort various Visual Quality Objectives (VQOs) were established for areas seen from travel routes. VQOs indicate allowable changes to visual quality as a result of management activities. The VQO definitions and the VMS process are outlined below.

Visual Quality Objectives (VQOs)

- **Preservation:** Allows for ecological changes only. Management activities,⁸⁶ except for very low visual-impact recreation facilities, are prohibited.
- **Retention:** Management activities are not evident to the casual forest visitor.
- **Partial Retention:** Management activities may be evident, but must remain subordinate to the characteristic landscape.
- **Modification:** Management activities may dominate the characteristic landscape, but must follow naturally established form, line, color, and texture characteristics.
- **Maximum Modification:** Management activities may dominate the characteristic landscape, but must follow naturally established form, line, color, and texture characteristics and should appear as a natural occurrence when viewed as background.
- **Unacceptable Modification:** Size of activities is excessive or poorly related to scale of landform and vegetative patterns in characteristic landscape, or overall extent of management activities is excessive, or activities or facilities that contrast in form, line,

⁸⁴ USDA Forest Service 1974

⁸⁵ USDA Forest Service 1995b

⁸⁶ Management Activity: An activity of man imposed on a landscape for the purpose of harvesting, traversing, transporting or replenishing natural resources.

color, or texture are excessive. All dominance elements in the management activity are visually unrelated to those in the characteristic landscape. Unacceptable modification includes those visual impacts, which exceed 10 years duration patterns.

The following VMS components and/or definitions were used to develop the VQOs for the Shasta-Trinity National Forest. See Agriculture Handbook 462⁸⁷ for further information.

- **Sensitivity Level:** A measure of people's concern for the scenic quality of an area. Travel routes, use areas and water bodies were rated according to the volume of use, duration and National or local importance.
- **Distance Zones:** The distance from which a landscape is viewed has an effect on how much detail, pattern, color, line, and texture a viewer sees. To capture this difference, various distance zones are established from sensitive viewing areas.
 - **Foreground** – The portions of a view between the observer and up to ½ mile distant. The surface patterns on objects and visual elements are important in the 'foreground' views.
 - **Middle ground** – The portions of a view from 0.5 mile to five miles from the observer, (actual distance depends on actual viewing distances).
 - **Background** – The view five miles or more from the observer and as far into the distance as the eye can detect the presence of objects.
- **Variety Class:** A third component of the scenic environment relates to the degree of variety within a visual landscape (variety class). The more distinctive the variety class the more restrictive the visual quality objective (VQO). For instance, if a site has unusual features such as water features or distinctive rock outcroppings, the landscape would be classified as a higher variety class while, if a landscape has no distinctive features and has monotonous vegetation, it would be viewed as a more 'common' landscape (i.e. less visually interesting).

Scenery Management System (SMS)

Scenic Attractiveness

The Scenery Management System describes three classifications of scenic attractiveness, as follows:

Class A – Distinctive – Areas where landform, vegetation patterns, water characteristics, and cultural features combine to provide unusual, unique, or outstanding scenic quality. These landscapes have positive attributes of variety, unity, vividness, mystery, intactness, order, harmony, strong uniqueness, pattern, and balance.

Class B – Typical – Areas where landform, vegetation patterns, water characteristics, and cultural features combine to provide ordinary or common scenic quality. These landscapes have generally positive, yet common, attributes of variety, unity, vividness, mystery, intactness, order, harmony, uniqueness, pattern, and balance. Normally they would form the basic matrix within the ecological unit.

Class C – Indistinctive – Areas where landform, vegetation patterns, water characteristics, and cultural land use have low scenic quality. Often water and rock form of any consequence are

⁸⁷ USDA Forest Service 1974

missing in class C landscapes. These landscapes have weak or missing attributes of variety, unity, vividness, mystery, intactness, order, harmony, uniqueness, pattern, and balance.

Scenic Integrity

Scenic integrity indicates the degree of intactness and wholeness of the landscape character; it is a continuum ranging over five levels of integrity from very high to very low.⁸⁸ Corresponding levels of existing scenic conditions and visual quality levels from the original Visual Management System⁸⁹ are shown to the right of each level. See table 2 below.

Table 2. Scenic Integrity Levels and their corresponding VQO levels.

Scenic Integrity Level	VQO Level	Description
VERY HIGH (Unaltered)	preservation	Landscapes where the valued landscape character "is" intact with only minute if any deviations. The existing landscape character and sense of place is expressed at the highest possible level.
HIGH (Appears Unaltered)	retention	Landscapes where the valued landscape character "appears" intact. Deviations may be present but must repeat the form, line, color, texture, and pattern common to the landscape character so completely and at such scale that they are not evident.
MODERATE (Slightly Altered)	partial retention	Landscapes where the valued landscape character "appears slightly altered." Noticeable deviations must remain visually subordinate to the landscape character being viewed.
LOW (Moderately Altered)	modification	Landscapes where the valued landscape character "appears moderately altered." Deviations begin to dominate the valued landscape character being viewed but they borrow valued attributes such as size, shape, edge effect and pattern of natural openings, vegetative type changes or architectural styles outside the landscape being viewed. They should not only appear as valued character outside the landscape being viewed but compatible or complimentary to the character within.
VERY LOW (Heavily Altered)	maximum modification	Landscapes where the valued landscape character "appears heavily altered." Deviations may strongly dominate the valued landscape character. They may not borrow from valued attributes such as size, shape, edge effect and pattern of natural openings, vegetative type changes or architectural styles within or outside the landscape being viewed. However, deviations must be shaped and blended with the natural terrain (landforms) so that elements such as unnatural edges, roads,

⁸⁸ USDA Forest Service 1995b

⁸⁹ USDA Forest Service 1974

Scenic Integrity Level	VQO Level	Description
		landings, and structures do not dominate the composition.
UNACCEPTABLY LOW	unacceptable modification	Landscapes where the valued landscape character being viewed appears extremely altered. Deviations are extremely dominant and borrow little if any form, line, color, texture, pattern or scale from the landscape character. Landscapes at this level of integrity need rehabilitation. This level should only be used to inventory existing integrity. It must not be used as a management objective.

Intensity of Effects

“Intensity” refers to the severity of effects or the degree to which the action may adversely or beneficially affect a resource. The intensity definitions used throughout the effects analysis are described below.⁹⁰

Visitor Use / Recreational Users

- **Negligible:** Visitors would not be affected, or changes in visitor experience would be below or at the level of detection. Visitors would not likely be aware of the effects associated with the alternative.
- **Minor:** Changes in visitor experience would be detectable, although the changes would be slight. Visitors could be aware of effects associated with the alternative but only slightly.
- **Moderate:** Changes in visitor experience would be readily apparent. Visitors would be aware of the effects associated with the alternative and would likely be able to express an opinion about the changes.
- **Major:** Changes in visitor experience would be readily apparent and would have important consequences. Visitors would be aware of the effects associated with the alternative and would likely express a strong opinion about changes.

Duration of Effects

- **Temporary effects** are those occurring from project activities in the immediate future but lasting one year or less.
- **Short-term effects** are those occurring from project activities that are expected to last for from 2-5 years.
- **Long-term effects** are those occurring from project activities over several seasons (typically 5 years and beyond).

⁹⁰ USDA Forest Service 2009

Affected Environment

The project area is within the Sierra-Cascade Landscape Province Character Type – as defined by the Visual Management System.⁹¹ The province is characterized by mixed topography of varying aspects, steepness and ridge orientation formed by two significant mountain ranges intersecting through the province. The project area is representative of the province's defined character and is further enhanced by the presence of Shasta Lake.

The forest is comprised of mixed conifer stands (e.g. Douglas-fir, ponderosa pine, grey pine) with variable understory (e.g. Oregon grape, deer brush, bitter cherry, coffee berry, etc.), hardwood (e.g. black oak, madrone, tanoak, live oak) species and extensive montane chaparral brush fields (e.g. green leaf Manzanita, white leaf Manzanita, canyon oak and chamise). Currently most of the project area consists of dense, relatively homogeneous forested stands of medium- and small-sized trees, with between 60 and 100 percent canopy cover. See the project Vegetation Report for further characterization of vegetation within the project area.

Although there are no sensitive travel corridors within the project area, Interstate 5 (I-5) to the west provides intermittent views of the westernmost portion of the project area. The project area, mostly located within the Whiskeytown-Shasta-Trinity National Recreation Area (NRA), carries the VQO of Retention or Partial Retention, which corresponds to the respective scenic integrity levels of High and Moderate.

The project area currently meets the assigned VQOs and is characterized by a mixture of scenic variety and attractiveness classes. Some areas, particularly along the Gray Rocks and Devils Rock-Backbone, are scenic attractiveness Class A – Distinctive and have a Very High scenic integrity level. Other areas are characterized as Class B (Typical) or Class C (Indistinctive). A mixture of variety classes (Distinctive, Common and Minimal) can also be found.⁹² However, several visual components adjacent to the project area have been negatively affected by past wildfires. Much of the Jones Valley area burned in 1999 and 2004 with high vegetation severity and left the affected landscape devoid of trees and with dense concentrations of snags and downed logs.

Due to the excessive vegetation density many of the valued scenery attributes are absent or at risk of loss. The dense stands of small- and intermediate-sized trees tend to obscure views into the stand, thereby diminishing the variety of small open spaces; large trees with distinctive bark; colorful hardwoods, shrubs, forbs, and grasses; and fewer opportunities to view wildlife. Additionally, because of the role these dense stands tend to play in a wildfire situation, there is a much higher risk of a stand-replacing fire blackening the entire foreground. People tend to find the results of these large- scale fires very unattractive and inconsistent with historic scenic character within the project area.^{93,94}

Current fuel conditions in the project area increase the risk that future wildfires will be widespread with high vegetation severity (see the project Fire and Fuels Report and Vegetation Report in the project file).

⁹¹ USDA Forest Service 1974

⁹² Joyce 2011 personal communication

⁹³ Starbuck et al. 2006

⁹⁴ Taylor and Daniel 1984

Desired Condition

Desired Future Condition for the two management areas in the project area is discussed above in the Regulatory Framework section along with the standards and guidelines for achieving these desired conditions. Within the NRA MA, scenic values are conserved. Vegetation is managed to a level that results in healthy forest stands, maintenance of wildlife habitat, good scenic quality, public health and safety, and reduction of fire hazards. Management activities maintain the visual quality at a level which provides for a landscape in which human activities are subordinate to the natural landscape. Within the Nosoni MA, stand densities appear more open with less ingrowth particularly in stands on sites where wild fire plays a key role in stand development. Vegetation manipulation takes place to manage habitat for elk, turkey, deer, black bear, and old-growth dependent species, as well as fire hazard reduction.

In general, the desired landscape character is a healthy forest ecosystem that looks natural from sensitive viewpoints and that meets assigned VQOs to provide a desirable experience to forest visitors. The landscape is resilient to disturbances that might reduce the scenic quality of the project area.

There are eight forest measurements that can frequently be found in the literature as relating to scenic value: species composition, slash or downed wood, herbaceous cover, smaller trees and understory, bigger trees, basal area or other measurements of total tree density, crown closure, and time since harvest. The following is a brief summary of the findings related to these measurements from the literature:

- Stands composed of a mix of species are preferred as they provide visual diversity.
- Downed wood volumes are negatively correlated with scenic beauty.
- Ground covers in the form of grasses and forbs were found to have a positive effect on scenic beauty.
- Increasing numbers of saplings detract from scenic beauty.
- Numerous studies have suggested that big trees have a positive effect on the predicted scenic beauty of forest stands.
- Positive relationship between basal area and scenic value.
- Crown closure may be a forest attribute that has little or no significant impact on scenic beauty when isolated from other forest attributes.
- Scenic value immediately after treatment is low, rises as residuals degrade and vegetation develops then drops off as regeneration obscures the view.⁹⁵

Ryan⁹⁶ published a synthesis of research on aesthetics and fuels management which included the following information related to scenic values:

- Landscapes usually considered less visually appealing are wide-open areas with uniform or monotonous vegetation. Conversely, extremely dense vegetation, especially at eye level, also is not preferred.
- In general, natural forest disturbances that result in extensive areas of dead or dying trees, such as the destruction of the forest by fire or flooding, are perceived negatively. However, natural disturbance that is less severe, such as less intense fires that burn the

⁹⁵ Hoffman 1996

⁹⁶ Ryan 2005

understory but do not kill mature trees, often creates more preferred forests, especially over time.

- The amount of visual access, or how far one can see into a forest, also has been found to be a significant predictor of landscape preference.
- Openings in an otherwise enclosed forest are often perceived to be aesthetically pleasing.
- Forests that have larger numbers of herbaceous plants on the ground level are more preferred. In some instances, fuels reduction such as in prescribed burning can increase the number of low herbaceous plants that are part of these visually preferred settings.

Project Design Features

A complete description of project design features for all resources is in Chapter 2 of the EA. Design features, unless stated otherwise, apply to all action alternatives for this project.

1. The following guidelines apply when planning prescribed underburning:
 - a. In areas visible from the I-5 corridor, Shasta Lake and developed recreation sites, the size of burn areas (brown/black vegetation) would be limited to 20 percent or less of the viewshed. Topographic features would be used in small drainage areas to determine burn block size, with an overall goal that individual burned areas would be approximately 250 acres or less.
 - b. In other areas, burn blocks would be located so they are randomly scattered throughout the entire area to minimize visual impacts in any given viewshed. Where practical, burn plans and prescriptions would be developed for treatment areas greater than 250 acres that would create a mosaic of burned and unburned areas and trend the project area toward a multi-age/multi-structure ecosystem.
2. Burn piles would be located away from leave trees to avoid crown burning. Where visible to the public (such as along roads and near recreation sites), burn pile remnants would be scattered.
3. Where visible in the foreground (0-1/4 mile) to the public (such as along roads and near recreation sites), prescribed fire techniques to reduce the fire scarring of tree trunks would be used as practicable.

Monitoring

Information gathered before, during, and after accomplishing project activities is used to determine the how effectively projects are accomplished through project objectives and design features. It provides a feedback mechanism not only for this project but for similar future projects. Monitoring is completed at recurring intervals as a basis for implementing direction in the forest plan. Project effectiveness monitoring is completed by routine sampling of specific projects at specified time intervals.

Monitoring of impacts to visual quality, particularly from key locations (e.g., Shasta Lake, the I-5 corridor, Gilman Road and various recreation sites) would occur following treatments. Additional data may be gathered through input from forest visitors and concessionaires to determine the public's interpretation of visual quality in treated areas.

Environmental Consequences

Alternative 1 – No Action

Under this alternative none of the proposed actions would occur, current management and uses of the National Forest System lands in the project area would continue and no direct effects to visual quality would result. This alternative represents the existing conditions of the project area and the progression of these conditions that would occur naturally over time if we do not implement an action alternative. This alternative provides a baseline of conditions for us to compare with potential effects of the action alternatives.

Direct, Indirect and Cumulative Effects

The No Action Alternative would result in no immediate change to visual quality objectives within the project area and the corresponding Scenic Integrity Levels would continue to exist except where significant disturbance has occurred (e.g., Jones Valley). Quality of scenery could change overtime, as vegetation continues to grow and become denser. Favorable landscape views such as topography, open spaces, and other natural features when seen from roads, trails, and watercraft may become obscured and concealed from view. Fewer opportunities for the growth of large trees will exist along with a lack of visual diversity in tree species and size class. Landscapes with dense and homogeneous vegetation have been shown to have low scenic quality,⁹⁷ resulting in a less interesting visual experience.

Furthermore, this alternative would not address the current high fuel levels. Dense, untreated areas of vegetation and debris also increase the potential for large landscape scale fires that are more severe and extensive than ones that occur within the natural historical regime (see the project Fire and Fuels Report). If a large, high intensity wildfire occurs within the project area, the landscape character could be greatly altered with the complete loss of existing vegetative cover, potential soil scorching, and possible scars from ground disturbing fire suppression activities that would result in line and color contrasts. The resultant blackened landscape, followed by dead standing and fallen trees would affect the scenic resources and lower the VQOs for decades.

In general, natural forest disturbances that result in extensive areas of dead or dying trees, such as the destruction of the forest by fire, are perceived as having a negative impact on visual beauty. For example, unburned pine forests receive higher ratings on scenic quality than burned areas. However, natural disturbance that is less severe, such as less intense fires that burn the understory but do not kill mature trees, often creates more preferred forests, especially over time.⁹⁸ Scenic quality ratings improved relative to unburned areas from 3 to 5 years following light fire but seriously declined for 5 or more years following severe fire.⁹⁹ A large fire could create a larger scale contrast in the landscape than would result from the action alternatives and may take much longer to recover resulting in negative impacts for a longer period of time.

The effects on the scenic settings associated with the project area, and of Shasta Lake in general, from a major wildfire would be adverse to both short- and long-term VQOs and Scenic Integrity Levels. These effects would likely occur on a large scale and would likely be quite noticeable even to the casual forest visitor, as evidenced by conditions following the Bear and Jones fires in Jones Valley (see Figure 2 below).

⁹⁷ Ryan 2005

⁹⁸ Ibid.

⁹⁹ Taylor and Daniel 1983

Figure 2. The 2004 Bear Fire in Jones Valley – three years post-fire



Additionally, in the event of a large-scale fire, impacts to scenery from protracted periods of smoke and poor air quality would be short-term and moderate- to- major. Persistent temperature inversions during times of atmospheric stability could trap smoke over large areas (as in the 1987, 1999 and 2008 wildfires), limiting middle ground and background views.

Alternative 2 – Proposed Action

This alternative proposes 41,836 acres of fuels treatments that would be accomplished over 7 to 10 years. The overall goal is to create a landscape that would be more resilient to fire, healthy and able to sustain or improve visual quality.

Direct and Indirect Effects

Implementation of the proposed action would likely result in more acres of low-intensity burned areas in the long term than the current suppression-only response. Therefore, indirect effects of implementing the proposed action would be both positive (improved visual penetration into the forest, increased mosaic of vegetation types and age classes, and lower risk of more damaging fires in the long term) and negative (such as blackened landscapes in the short term). Overall reduction in VQOs is not predicted to occur, given the size of the viewshed and the nature of effects produced by prescribed fire as evidenced by similar projects around Shasta Lake (see table A-1 in Appendix A).

The removal of some of the dense understory through prescribed burning would allow visitors to see further into the forest, allowing for more varied foreground and middleground views. More forest openings would also enhance visual diversity in form, color, texture, and scale which is seen as more interesting or visually desirable than a homogeneous landscape. In addition, grasses, wildflowers, and forbs, which are currently sparse due to lack of openings in the canopy, would become abundant and diverse. Studies have shown that desirable aesthetic effects are created and

sustained through fuels reduction treatments such as prescribed fire.^{100 101} A study in the ponderosa pine ecosystem of northern Arizona found that low-severity fires actually increased scenic beauty ratings, especially a year or two after the fires, but high-severity crown fires decreased them¹⁰². These researchers attributed this to the fact that prescribed fire cleared out some of the dense understory vegetation, opened up views into the forest, and increased the herbaceous ground cover. In Western forests, groundcover in open, park-like stands results in above-average scenic beauty.¹⁰³

The majority of what can be perceived as negative effects to the visual resource occurs during the project implementation phase. While the treatments are being carried out, visual signs of activity (i.e., cut stumps, ground disturbance, unnaturally bare soils, firelines, treatment edges, burn piles) are expected in the foreground distance zone. Scenes of treatment during this initial project implementation phase do not represent a completed treatment though; effects to scenic quality are based on completed treatments.

Prescribed fire operations would take advantage of existing or naturally occurring fuelbreaks to limit the spread of fire and to encourage a natural look. Approximately 4.61 miles of dozer line would be constructed or reconstructed, but this would occur in areas with significant canopy cover and would not be visible from Shasta Lake. The dozer lines would be approximately 8 feet wide and would be constructed to reduce their visibility from roads.

Thinning activities would be limited to areas adjacent to private property boundaries and recreation residence tracts. A temporary reduction in the immediate foreground at the site would occur because of the existence of piled material and small, low-cut stumps. After the debris is removed (through pile burning) visual quality would be expected to increase due to the reduction in understory vegetation and improved viewing distances, as suggested by Ryan and others.¹⁰⁴ The proposed thinning treatments would likely be conducted outside of peak visitor season, so the resulting disturbance would have only minor effects to visitors' visual experience.

Degradation in visual quality would be most visible in areas where forest canopy cover is limited (such as brush fields). In addition, smoke impacts during and immediately following project implementation could hamper middleground and background views. These effects would be temporary (less than 1 year) and would be reduced by design features that would regulate the amount of contiguous area treated at any one time.

The prescribed fire would cause the charring or blackening of trees to varying extents throughout the project area, although techniques would be used to reduce the occurrence. Vegetation fire severity modeling predicts less than 10 percent of either moderate or high severity (see project Vegetation Report) under either action alternative. After treatments have been completed evidence of burning on trees and various ground features may be present, but such sights are naturally occurring in fire-adapted ecosystems. If residual trees were scorched, presence of red or black trees would present a contrast to the otherwise green surroundings. These contrasts would soften and become less noticeable over time, within 1-3 years, as grasses and forbs reestablish and a mosaic of vegetation types add variety to the landscape.

¹⁰⁰ Kaplan and Kaplan 1989

¹⁰¹ Ryan 2005

¹⁰² Taylor and Daniel 1984

¹⁰³ Rosenberger and Smith 1998

¹⁰⁴ Ryan 2005

Prescribed burns have been found to negatively impact scenic beauty in the short term, but with ground vegetation recovery, can enhance scenic beauty within five years.¹⁰⁵ (Rosenberger and Smith 1998). Results of studies conducted by Winter and Knap¹⁰⁶ showed that recreationists on public lands were generally not surprised or bothered by smoke or fire-damaged vegetation, and that they generally supported prescribed fires in forested areas that had been thinned or cleared to reduce fire danger.

Implementing fuel reduction through prescribed fire would maintain or encourage conditions favored by forest visitors for scenic beauty (e.g., large trees, open forest structure, herbaceous groundcover) over much of the project area.¹⁰⁷ This would enhance the experience had by the public, particularly with respect to “nature encounters” (e.g., increased opportunities to observe wildlife) and enjoyment of late-successional forest characteristics such as large trees). Modeling by Ribe¹⁰⁸ demonstrates that following prescribed fire, increases in herbaceous plants and wildlife sightings would occur, resulting in visually preferred conditions.

The overall result of the proposed treatments will be an improved visual quality with attributes of a forest resembling one closer to its natural historical fire regime. Although fire managed for ecosystem benefits still results in blackened landscapes, the impacts are far less devastating than the impacts from large, high-intensity wildfire events that have been common across the West in recent years. Effects to viewsheds are more quickly recovered with naturally occurring fire events. The occurrence of severe burns that leave the land looking more like a “moonscape” are less likely to occur once fire has been returned to a more natural role in the ecosystem. Scott¹⁰⁹ found that the aesthetic consequence of not managing fuel loads was very apparent; a control area burned by wildland fire and then salvage logged received the most negative aesthetic ratings.

Cumulative Effects

As discussed in the project Fire and Fuels Report, implementation of Alternative 2 would significantly decrease the risk of future large, severe wildfires in the project area. The proposed treatments would promote a landscape that is more resilient to significant change through wildfire disturbance and would, in turn, moderate the potential for detrimental changes in visual quality in the eastern portion of Shasta Lake.

The cumulative effects of Alternative 2 on visual quality, when combined with reasonably foreseeable actions, would depend upon mitigations implemented with those actions and their visibility from the project area. This is especially important in the context of viewsheds – such as from the lake itself – where vast expanses are visible at any one time and the negative effects caused by large, high-severity wildfires that can affect a substantial portion of a viewshed in a single event.

The cumulative changes related to reasonably foreseeable actions would have minimal impact to visual quality, assuming that the specific actions undertaken in future projects visible from the project area are consistent with standards and guidelines from the forest plan and the stated VQOs. Modeling predicts 85 to 90 percent low vegetation fire severity (see the project Vegetation Report).

¹⁰⁵ Rosenberger and Smith 1998

¹⁰⁶ Winter and Knap 2008

¹⁰⁷ Gobster 1994

¹⁰⁸ Ribe 1990

¹⁰⁹ Scott 1998

The Bureau of Reclamation (BOR) proposal to raise Shasta Dam and enlarge Shasta Lake reservoir is a foreseeable action. However, Alternative 2 would not add to any future effects to visual quality from the BOR project. Any adverse effects of the Green-Horse Project on visual quality in the project area would be temporary and would likely have dissipated by the time the BOR project is implemented.

Cumulative effects on visual quality would also depend upon short- and long-term management actions to maintain the reduced fuel loads following project implementation. Cumulative changes to visual quality in the project area would be minimal given that future projects should be consistent with Shasta-Trinity forest plan VQOs and other Standards and Guidelines therein, and current Scenic Integrity Levels would be maintained. Figures 2 and 3 below illustrate the range of visual effects predicted under Alternative 2.



Figure 3. Portion of Green Mountain Prescribed Fire Project - three years post-burn



Figure 4. Portion of Green Mountain Prescribed Fire Project - four years post-burn

Alternative 3 – No Forest Plan Amendment

This alternative proposes 13,275 acres of fuels treatments that would be accomplished over 7 to 10 years using an adaptive management strategy. No dozer line construction would occur. No Forest Plan amendment to downed fuel levels would be implemented under this alternative.

Most high visitor use areas would be eliminated from treatment under this alternative, which would eliminate effects visible from many of the prominent viewpoints. Some of the remaining points of interest for visual quality include Arbuckle Flat Campground, Chirpchatter Campground, Madrone Campground Fenders Ferry bridge/FS road 34N17 and the upper reaches of the Pit Arm of Shasta Lake.

Most effects of Alternative 2 also apply to this alternative but are reduced in scale due to a significant decrease in the acreage of proposed treatments within or close to recreation sites and areas of high visitor use. The direct, indirect and cumulative effects to visual quality are similar to those of Alternative 2 in the treated areas (see figures 2 and 3 above); however, few of the prominent viewpoints affected under that alternative would likely be affected under this alternative. The direct, indirect and cumulative effects to visual quality in areas that remain untreated would be similar to those described under Alternative 1 (no action).

Compliance with the Forest Plan and Other Regulatory Direction

With incorporation of the proposed design features, implementation of either action alternative would be consistent with direction provided in the forest plan, Forest Service manuals, and other applicable policies, laws, and direction (see Regulatory Framework section of this report) for preservation of visual quality, air quality and other values that contribute to the recreation experience within the project area. The no action alternative would also meet regulatory direction,

at least in the short term. However, over the long term, continued accumulation of historically-departed fuel levels would increase the likelihood of large, high-severity fires that could degrade those aforementioned values.

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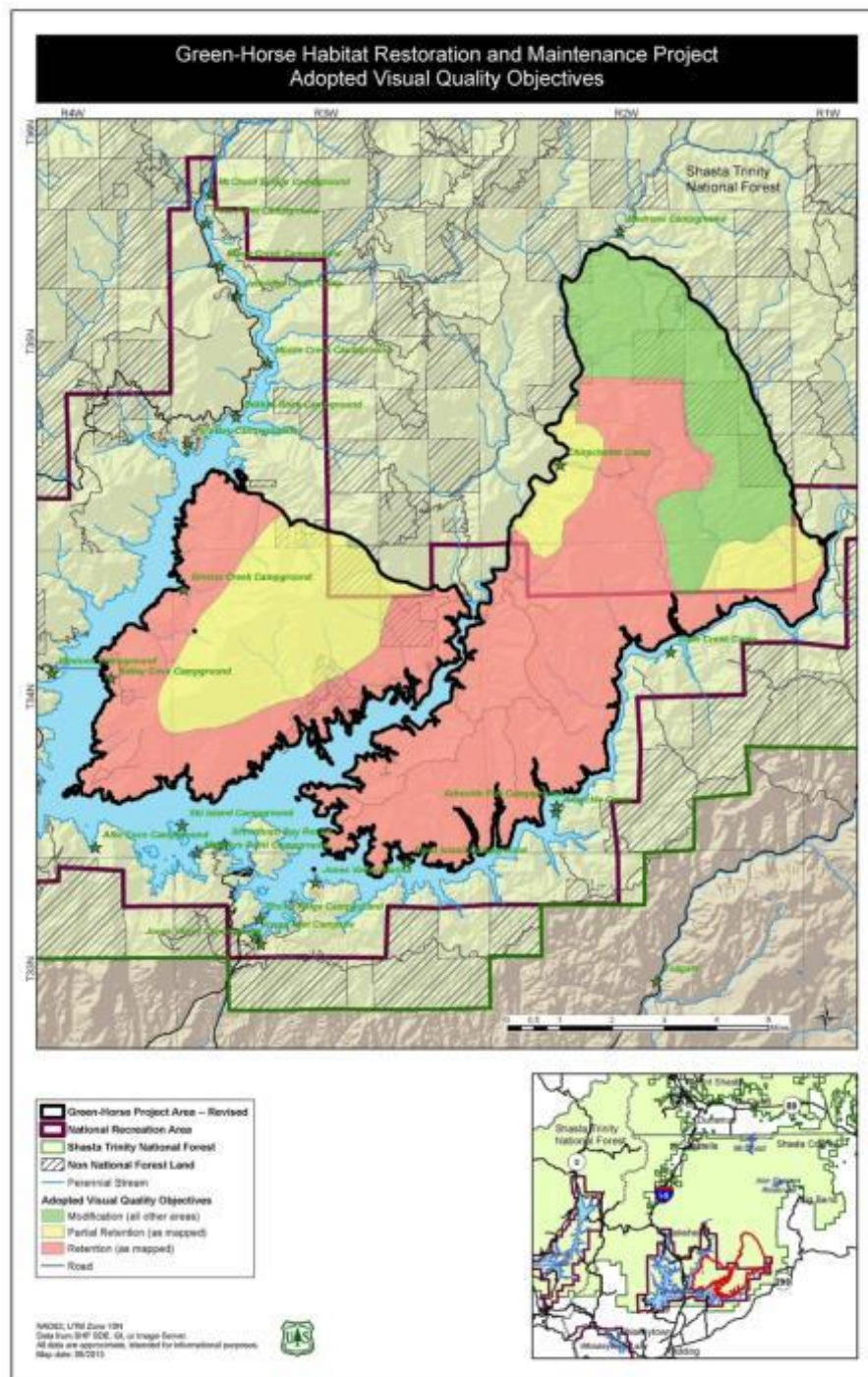
Appendix A – Past, Current, Ongoing and Reasonably Foreseeable Actions

Table A-1. Past, current/ongoing and reasonably foreseeable future actions and events

Activity	Description	Date(s)	Location	Scope
Miscellaneous fires	Wildfires	1910-1999	In and adjacent to the project area	22,442 acres within project area, 53,746 acres within viewshed
Fountain Fire	Wildfire	1992	Fire south of project area in viewshed	4,815 acres within viewshed
Jones Fire	Wildfire	1999	Fire south of project area in viewshed	2,308 acres within viewshed
Bear Fire	Wildfire	2004	Fire south of project area in viewshed	3,917 acres within viewshed
SHU Lightning Complex	Wildfire	2008	Fire south of the project area in viewshed	780 acres within viewshed
Green Mountain Vegetation Management Project	Vegetation Restoration	2001	Within the project area	6,600 acres between the Pit Arm and Squaw Arm
Bear Hazardous Fuels Reduction Project	Fuels Reduction	ongoing	South of the project area	4,465 acres south of the Pit Arm
Gilman Road Shaded Fuelbreak	Fuels Reduction	2003	West of the project area	73 acres west of the McCloud Arm
Bear Fuels Fire Recovery	Post-Fire Hazardous Fuels Reduction	2005	South of the project area	336 acres south of the Pit Arm
Bear Mountain Fire Salvage Timber Sale	Fire Salvage Timber Sale	1991	South of the project area	58 acres south of the Pit Arm
Garden Ridge Prescribed Burn	Fuels Reduction	1998	North of the project area	1,200 acres north of Squaw Creek
Horse Mountain Prescribed Burning	Fuels Reduction	1997	Within the project area	2,500-3,500 acres between the McCloud Arm and Pit Arm
Iron Canyon Thinning and Fuels Reduction	Fuels Reduction	1997	East of the project area	973 acres in the Pit River watershed
Clikapudi Trail Loop Addition Project	Recreation	2006	South of the project area	1 mile of new trail south of Pit Arm
Travel Management	Travel Management	2010	Forest-wide	Manage travel on public lands Forest-wide
Lower McCloud Fuels Management Project	Fuels Reduction	Proposed	North of the project area	22,399 acres in the McCloud River & Pit River watersheds
Activity	Description	Date(s)	Location	Scope

Jones Valley Marina, Lakeview Marina, Master Plan	Special Uses Administration	Proposed	South of the project area	Special uses permit administration on 15 acres
Elk Trail Water System Upgrade	Special Uses Administration	Proposed	South of the project area	Special uses permit administration on 1 acre
Bureau of Reclamation Shasta Lake Water Resources Investigation	Engineering – proposal to raise Shasta Dam and enlarge Shasta Lake reservoir	Proposed	Project area and surroundings	Potential inundation of up to 2,498 acres of terrestrial perimeter around lake, 1,015 acres within the project area
Timber Harvest (Private Lands)	Timber Harvest Activities	Ongoing	Within and outside of project area	9,291 acres completed; 4962 acres approved, pending, or unlogged.
Wildfire suppression	Suppression of Wildfires	Ongoing	Throughout the forest, within and outside the project area	Unknown

Appendix B – Maps



Map B-1. Forest Plan Visual Quality Objectives (VQOs) – Green-Horse project area